Amendments to the Claims

Claims 34-97 have been cancelled without prejudice to their subsequent introduction into a related application. Claims 13, 14, 17, 29 and 30, limited to nonelected species, have been withdrawn without prejudice to their reinstatement into this or a related application. Upon entry of this paper, claims 1-12, 15, 16, 18-28, and 31-33 will be pending and under consideration.

Listing of Claims:

1. (Original) An engineered chimeric protein whose interaction with a target biomolecule is regulated by the presence, concentration, or absence of a ligand, the protein comprising: an interaction domain that binds to a target biomolecule; and a ligand binding domain comprising a peptide that binds to a preselected ligand, selection of said peptide for binding being informed by a recombinant display technique, wherein said peptide comprises an amino acid sequence selected to permit, and is bonded to said interaction domain at a position selected to permit, a change in the chimeric protein upon binding of the ligand to said ligand binding domain, said change regulating binding of the interaction domain to the target biomolecule.

2. (Original) A chimeric protein as in claim 1, wherein the recombinant display technique is selected from the group consisting of phage display, single chain antibody display, retroviral display, bacterial surface display, yeast surface display, ribosome display, two-hybrid techniques, three-hybrid techniques, and derivatives thereof.

3. (Original) A chimeric protein as in claim 1, wherein the peptide is no more than one hundred amino acids in length.

4. (Original) An engineered chimeric protein whose interaction with a target biomolecule is regulated by the presence, intensity, or absence of a stimulus, the chimeric protein comprising: an interaction domain that binds to a target biomolecule; and a detection domain comprising a peptide that recognizes a stimulus, said peptide comprising an amino acid sequence no more than

one hundred amino acids in length selected to permit, and being bonded to said interaction domain at a position selected to permit, a change in the chimeric protein upon receipt of the stimulus, said change regulating binding of said interaction domain to the target biomolecule.

5. (Original) A chimeric protein as in claim 4, wherein selection of said peptide is informed by a recombinant display technique.

6. (Original) A chimeric protein as in claim 4, wherein the stimulus is a perturbation of a thermodynamic state.

7. (Original) A chimeric protein as in claim 4, wherein the stimulus comprises electromagnetic radiation.

8. (Original) A chimeric protein as in claim 3 or 4, wherein the peptide is no more than eighty amino acids in length.

9. (Original) A chimeric protein as in claim 8, wherein the peptide is no more than sixty amino acids in length.

10. (Original) A chimeric protein as in claim 9, wherein the peptide is no more than forty amino acids in length.

11. (Original) A chimeric protein as in claim 10, wherein the peptide is no more than twenty amino acids in length.

12. (Original) A chimeric protein as in claim 1, 3, or 4, wherein the target biomolecule is a DNA sequence operably linked to a target gene and said protein regulates expression of the target gene.

13. (Withdrawn) A chimeric protein as in claim 1, 3, or 4, wherein the target biomolecule is a

protein which modulates transcription of a target gene.

14. (Withdrawn) A chimeric protein as in claim 13, wherein the target biomolecule is a transmembrane protein.

15. (Original) A chimeric protein as in claim 1, 3, or 4 further comprising a dimerization domain.

16. (Original) A chimeric protein as in claim 15, wherein dimerization of the chimeric protein is required for efficient binding to the target biomolecule, and wherein the change in the chimeric protein regulates dimerization thereof.

17. (Withdrawn) A chimeric protein as in claim 1, 3, or 4, wherein the interaction domain comprises a leucine zipper.

18. (Original) An engineered chimeric protein for modulating transcription of a target gene based on the presence, concentration, or absence of a ligand, the chimeric protein comprising: an interaction domain that binds to a DNA sequence operably linked to a target gene to regulate expression of the target gene; and a ligand binding domain comprising a peptide that binds to a ligand, selection of the peptide for binding being informed by a recombinant display technique, wherein said peptide comprises an amino acid sequence selected to permit, and is peptide bonded to said interaction domain at a position selected to permit, a change in the chimeric protein upon binding of the ligand to said ligand binding domain, said change regulating binding of the interaction domain to the DNA sequence thereby to modulate transcription of the target gene.

19. (Original) A chimeric protein as in claim 18, wherein the recombinant display technique is selected from the group consisting of phage display, single chain antibody display, retroviral display, bacterial surface display, yeast surface display, ribosome display, two-hybrid techniques, three-hybrid techniques, and derivatives thereof.

20. (Original) A chimeric protein as in claim 18, wherein the peptide is no more than one hundred amino acids in length.

21. (Original) An engineered chimeric protein for modulating transcription of a target gene based on the presence or absence of a stimulus, the chimeric protein comprising: an interaction domain that binds to a DNA sequence operably linked to a target gene to regulate expression of the target gene; and a detection domain comprising a peptide that is responsive to a stimulus, said peptide comprising an amino acid sequence no more than one hundred amino acids in length selected to permit, and being peptide bonded to said interaction domain at a position selected to permit, a change in the chimeric protein upon receipt of the stimulus, said change regulating binding of said interaction domain to the DNA sequence thereby to modulate transcription of the target gene.

22. (Original) A chimeric protein as in claim 21, wherein selection of said peptide is informed by a recombinant display technique.

23. (Original) A chimeric protein as in claim 21, wherein the stimulus is a perturbation of a thermodynamic state.

24. (Original) A chimeric protein as in claim 21, wherein the stimulus comprises electromagnetic radiation.

25. (Original) A chimeric protein as in claim 20 or 21, wherein the peptide is no more than eighty amino acids in length.

26. (Original) A chimeric protein as in claim 25, wherein the peptide is no more than sixty amino acids in length.

27. (Original) A chimeric protein as in claim 26, wherein the peptide is no more than forty amino acids in length.

28. (Original) A chimeric protein as in claim 27, wherein the peptide is no more than twenty amino acids in length.

29. (Withdrawn) A chimeric protein as in claim 18, 20, or 21, wherein the interaction domain comprises a helix-turn-helix motif.

30. (Withdrawn) A chimeric protein as in claim 29, wherein the interaction domain is derived from lambda repressor.

31. (Original) A chimeric protein as in claim 18, 20, or 21, wherein the interaction domain comprises a zinc finger motif.

32. (Original) A chimeric protein as in claim 18, 20, or 21 further comprising a dimerization domain.

33. (Original) A chimeric protein as in claim 32, wherein dimerization of the chimeric protein is required for efficient binding to the DNA sequence, and wherein the change in the chimeric protein regulates its dimerization, thereby regulating binding to the DNA sequence.

34 – 97. (Cancelled)